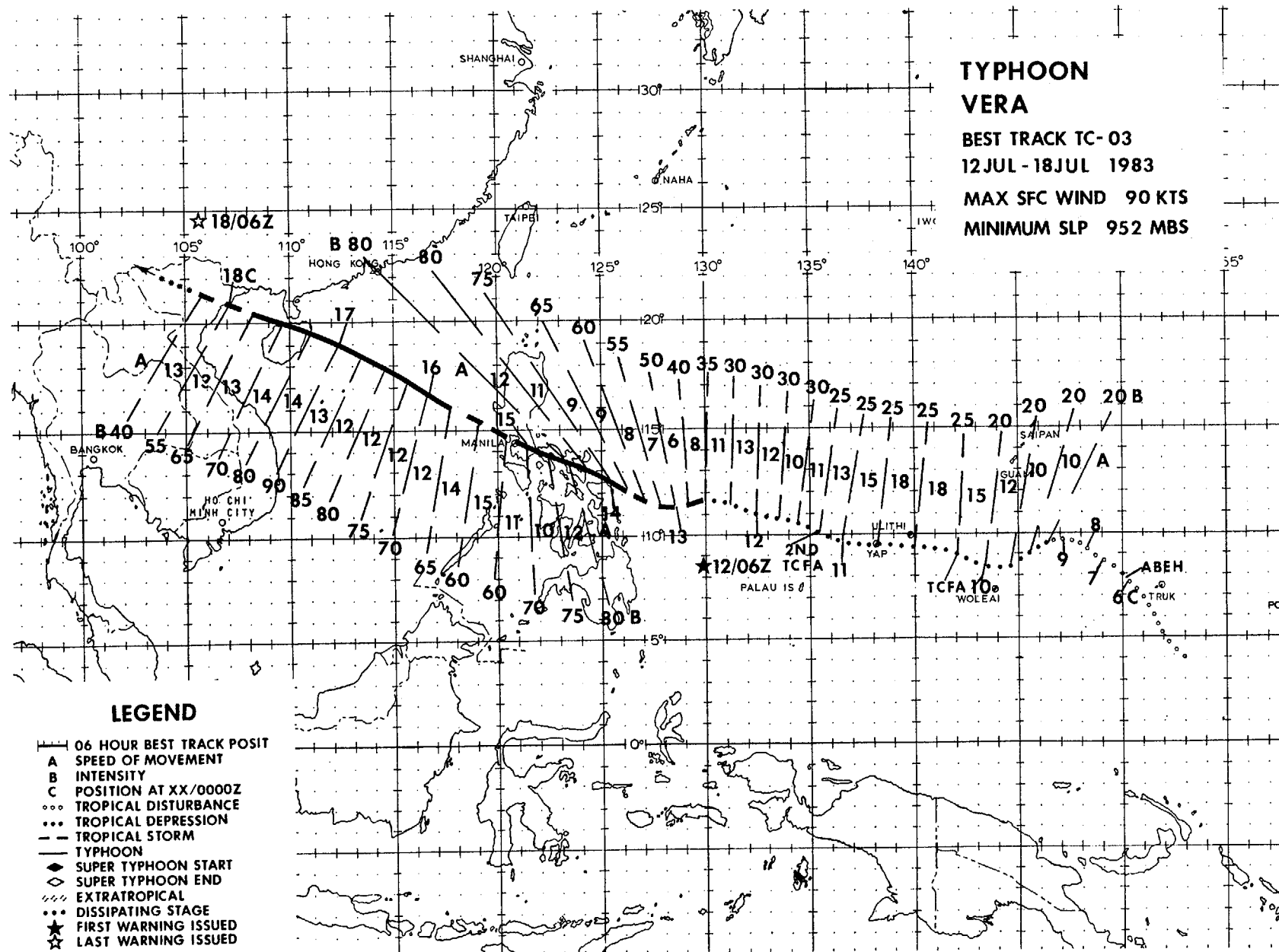


TYPHOON VERA

BEST TRACK TC-03
12 JUL - 18 JUL 1983

MAX SFC WIND 90 KTS
MINIMUM SLP 952 MBS



TYPHOON VERA (03W)

In the week that preceded the development of Typhoon Vera, the monsoon trough extended eastward from the Philippines to 160E as a nearly continuous zone of light surface winds and unorganized convection. However, on 4 July, surface westerlies increased to 15 kt (8 m/s) south of the trough and one circulation center, located near Truk Atoll (WMO 91334) became a persistent feature on JTWC gradient-level charts. A noticeable change in convective activity was observed on 8 July, as two distinct cloud masses began to develop within the monsoon trough. This change occurred as two upper-tropospheric cyclones intensified over the Philippine Sea, one east of Luzon about 125E and the other west of Guam about 140E. The upper cyclones increased the upper-level divergence near both convective disturbances and were instrumental in sustaining the development of each during the subsequent three day period. The westernmost disturbance became Typhoon Tip (02W) and the disturbance which moved northwestward from the Truk area became Typhoon Vera.

The first of two TCFAs on Vera was issued at 100600Z, when satellite imagery and 200 mb wind data indicated that a well-defined upper-level circulation had developed over the system. Development of a well-defined surface circulation was slow and the formation alert was reissued at 110600Z after a reconnaissance aircraft investigative mission could not locate a circulation center in the low-level wind field. Figure 3-03-1 shows the suspect dis-

turbance as it appeared on satellite imagery at the time of this reconnaissance mission. Twenty-four hours later, the initial warning was issued for Tropical Depression 03W when data from the next reconnaissance aircraft mission indicated a closed surface circulation with 30 kt (15 m/s) winds and a 1004 mb central sea level pressure.

During the first 36 hours in warning status, Vera intensified quite rapidly and reached typhoon strength by 131800Z. During this period, Vera slowed from an average speed of 12 kt (22 km/hr) to less than 6 kt (11 km/hr). In fact, during one 12-hour period (121200Z to 130000Z), virtually all fix positions were within a 30 nm (56 km) area. On 13 July, Vera turned toward the west-northwest and the central Philippines with the speed of movement increasing to 12 kt (22 km/hr). Vera skirted the north-eastern portion of the island of Samar at 140000Z, with maximum sustained surface winds near 75 kt (39 m/s). Figure 3-03-2 shows Typhoon Vera as it entered the Philippines near the island of Samar. Forecasts from this point forward anticipated that Vera would weaken as it tracked through the Philippines. However, satellite imagery continued to indicate an increase in Vera's central cloud features until it reached the rugged terrain east of Manila at 150000Z. Vera then moved into Manila Bay, packing winds near 60 kt (31 m/s), and brought extensive flooding into low-lying areas of the Bay, especially

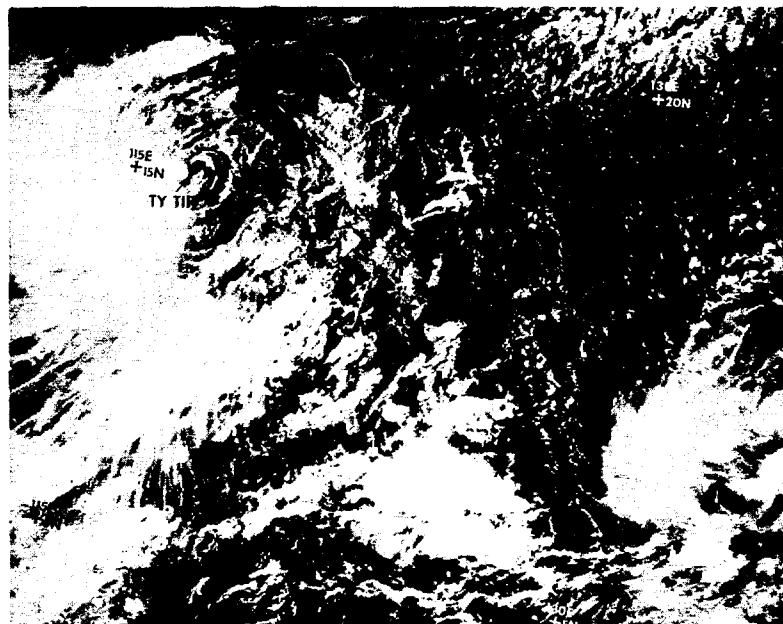


Figure 3-03-1. Typhoon Vera developing 160 nm (296 km) north of Koror at the time that the second formation alert was issued. Typhoon Tip is located to the west in the South China Sea (110644Z NOAA 7 visual imagery).

on Corregidor. Vera passed just southwest of the Naval Air Station, Cubi Point, at 150630Z and into the South China Sea. In its wake, Vera left thousands homeless, nearly 100 people dead and extensive property damage to the southern two-thirds of Luzon.

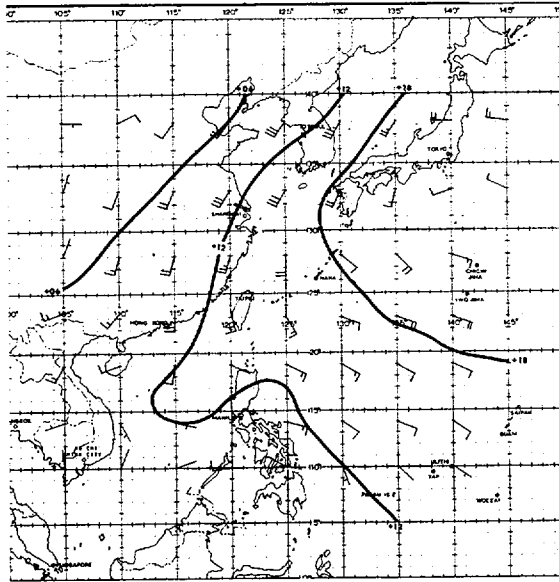
Track forecasts for Vera were quite good except for an anticipated turn northward as the system moved into the South China Sea. Figure 3-03-3 depicts the 48-hour NOGAPS 700 mb prog valid for 161200Z and the verifying analysis. The significant difference between the prognostic chart and the analysis was the extent and orientation of the subtropical ridge over eastern China. The prognostic fields suggested that a track

northward was possible; however, as Vera moved west-northwestward into the South China Sea, the ridge built westward and also became narrower between 20N and 30N. As a result, the forecast northward track never materialized and Vera persisted on its west-northwestward track.

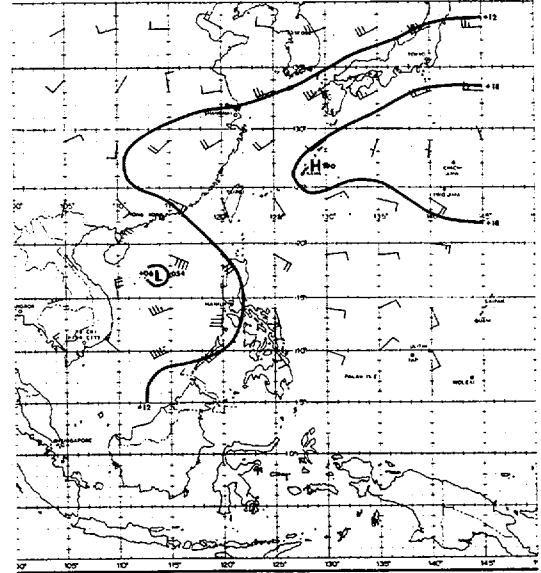
On 17 July, as Vera approached Hai-Nan Island, a peak intensity of 90 kt (46 m/s) was attained. Crossing Hai-Nan and moving into the northern portion of the Gulf of Tonkin, Vera slowly weakened before making landfall near Haiphong, Vietnam, at 180000Z. It then weakened rapidly over the mountainous terrain of northern Vietnam.



Figure 3-03-2. Typhoon Vera, located just east of Samar, with maximum winds near 70 kt (36 m/s). (132252Z NOAA 8 visual imagery).



a. 48-HOUR 700mb PROG



b. 700mb ANAL

Figure 3-03-3. NOGAPS 48-hour 700 mb prog [a] and verifying analysis [b] valid for 161200Z. Track forecasts toward southern China were influenced by a series of numerical progs which indicated that a pronounced southerly flow would develop in the middle and lower levels over the South China Sea.